

REMARKS

The Office Action mailed March 29, 2002, has been received and reviewed.

Claims 1 through 53 are currently pending in the application. Applicants affirm the election to prosecute the invention of Group I, claims 1 through 42 and 50 through 53. Claims 43 through 49 have been withdrawn from consideration as being drawn to a non-elected invention.

Claims 15 through 33 are allowed. Claims 1 through 3, 12 through 14, 34 through 36, and 50 through 53 stand rejected. Claims 4 through 11 and 37 through 42 have been objected to as being dependent upon rejected base claims, but the indication of allowable subject matter in such claims is noted with appreciation.

Applicants have amended claims 1, 5, 7, 8, 34, 35, 36, 38, 50 and 52, and respectfully request reconsideration of the application as amended herein. Claims 4 and 37 have been canceled.

Preliminary Amendment

Applicants' undersigned attorney notes the filing herein of a Preliminary Amendment on or about July 5, 2001, which filing was not acknowledged in the outstanding Office Action. Should the Preliminary Amendment have failed for some reason to have been entered in the Office file, Applicants' undersigned attorney will be happy to have a true copy thereof hand-delivered to the Examiner.

35 U.S.C. § 102(b) Anticipation Rejections

Anticipation Rejection Based on U.S. Patent No. 5,347,159 to Khandros et al.

Claims 1 through 3, 12 through 14, 34 through 36, and 50 through 53 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Khandros et al. (U.S. Patent No. 5,347,159).

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Brothers v.*

Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). The identical invention must be shown in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989).

With respect to amended independent claim 1, Applicants have added the subject matter of dependent claim 4 thereto. Since the Examiner has indicated that dependent claim 4 includes allowable subject matter, Applicants respectfully submit that amended independent claim 1 is now allowable.

With respect to amended independent claims 34, 36 and 50, they each have been amended with similar patentable limitations as that amended in independent claim 1. Therefore, Applicants respectfully submit that independent claims 34, 36 and 50 are allowable for at least the same reasons as independent claim 1.

With respect to dependent claims 2-3, 12-14 and 51, they are each patentable based on at least their respective dependencies from independent claims 1 and 50.

Turning to independent claim 35, it recites the following (emphasis added):

35. A semiconductor die assembly comprising:
first and second semiconductor dice having mutually facing active surfaces;
a flexible dielectric interposer substrate having first and second opposing sides
and first and second adjacent portions separated by a spacer portion, the
first portion being disposed between the first and second semiconductor
dice and the second portion being secured over a back side of one of the
first and second semiconductor dice with the spacer portion over a side of
the semiconductor die over which the second portion is secured, the
interposer substrate further including conductive traces electrically
connected to the first and second semiconductor dice and extending
between the first portion and the second portion to an array of discrete
conductive elements projecting from the back side of the one of the first
and second semiconductor dice to which the second portion is secured.

In contradistinction to independent claim 35, the Khandros reference discloses, inter alia, a first chip 320 facing upward and a second chip 377 facing upward. Each chip appears to have its own interposer substrate, which is not disposed between the first and second chip and also

secured to a back-side of one of the first and second chip. *See* Khandros, col. 14, line 56 - col. 15, line 43; FIG. 11.

Since the Khandros reference does not teach or suggest “first and second semiconductor dice having mutually facing active surfaces” and “a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion, the first portion being disposed between the first and second semiconductor dice and the second portion being secured over a back side of one of the first and second semiconductor dice”, the Khandros reference does not anticipate independent claim 35. Thus, Applicants respectfully request the rejection of independent claim 35 under 35 U.S.C. § 102(b) be withdrawn.

With respect to amended independent claim 52, it recites similar recitations as independent claim 35. Therefore, independent claim 52 is patentable over the Khandros reference for at least the same reasons as independent claim 35. Thus, Applicants respectfully request the rejection of independent claim 52 under 35 U.S.C. § 102(b) be withdrawn.

As to dependent claim 53, it is allowable over the Khandros reference based on at least its dependency from independent claim 52.

Objections to Claims 4 through 11 and 37 through 42/Allowable Subject Matter

Claims 4 through 11 and 37 through 42 stand objected to as being dependent upon rejected base claims, but are indicated to contain allowable subject matter and would be allowable if placed in appropriate independent form. Applicants first thank the Examiner for indicating the allowable subject matter.

Applicants have amended independent claims 1 and 36 with allowable dependent claims 4 and 37, respectively. Thus, amended independent claims 1 and 36 are now allowable. Applicants therefore respectfully submit that dependent claims 5-11 and 38-42 are now allowable based on at least their dependency from allowable independent claims 1 and 36. Claims 4 and 37 have been canceled.

Serial No. 09/874,631

Information Disclosure Statement

Supplemental Information Disclosure Statement is filed concurrently herewith. Applicant respectfully requests that the information cited on the PTO-1449 be made of record herein.

Drawings

Applicants submit herewith corrected formal drawings, under cover of a separate Transmittal of Formal Drawings. Applicants respectfully request approval of the corrected formal drawings.

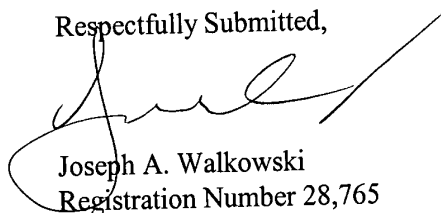
ENTRY OF AMENDMENTS

The amendments to claims 1, 5, 7, 8, 34, 35, 36, 38, 50 and 52 above should be entered by the Examiner because the amendments are supported by the as-filed specification and drawings and do not add any new matter to the application. Further, the amendments do not raise new issues or require a further search.

CONCLUSION

Claims 1-3, 5-14, 15-33, 34, 35, 36, 38-42 and 50-53 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicants' undersigned attorney.

Respectfully Submitted,



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Enclosure: Version With Markings to Show Changes Made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Claims 4 and 37 have been canceled without prejudice and/or disclaimer.

1. (Amended) A semiconductor die assembly comprising:
a first semiconductor die having an active surface, an opposing back side and a side extending transversely therebetween;
a plurality of bond pads over the active surface in a first arrangement; and
a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion and including a first plurality of electrical contacts on the first side of the first portion connected to the bond pads of the plurality and communicating through conductive traces with at least a second plurality of electrical contacts in a second arrangement different from the first arrangement on the second side of the second portion, said flexible dielectric interposer further including a third plurality of electrical contacts on the second side of the first portion in a third arrangement in communication with at least one of the first plurality of electrical contacts and the second plurality of electrical contacts through conductive traces;
wherein the first portion of the interposer substrate extends and is secured over the active surface of the first semiconductor die, the second portion is secured over the back side thereof and the spacer portion extends over the side thereof.

5. (Amended) The semiconductor die assembly of claim 1 [4], wherein the third arrangement is a mirror image of the second arrangement.

7. (Twice Amended) The semiconductor die assembly of claim 1 [4], further including discrete conductive elements disposed over the electrical contacts of the third plurality and projecting transversely to the active surface of the first semiconductor die.

8. (Twice Amended) The semiconductor die assembly of claim 1 [4], further including discrete conductive elements disposed over the electrical contacts of one of the second plurality and the third plurality and projecting transversely therefrom.

34. (Twice Amended) A semiconductor die assembly comprising:
a semiconductor die having an active surface, an opposing back side and a side extending transversely therebetween; and
a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion, the first portion disposed over the active surface of the semiconductor die and the second portion disposed over the back side thereof with the spacer portion over the side thereof, the interposer substrate further including conductive traces electrically connected to the semiconductor die and extending between the first portion and the second portion to an array of discrete conductive elements projecting transversely from the back side of the semiconductor die;
wherein said flexible dielectric interposer further including a plurality of electrical contacts on the second side of the first portion in communication with the conductive traces.

35. (Twice Amended) A semiconductor die assembly comprising:
first and second semiconductor dice having mutually facing active surfaces;
a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion, the first portion being disposed between the first and second semiconductor dice and the second portion being secured over a back side of one of the first and second semiconductor dice with the spacer portion over a side of the semiconductor die over which the second portion is secured, the interposer substrate further including conductive traces electrically connected to the first and second semiconductor dice and extending between the first portion and the second portion to an array of discrete conductive elements projecting from the back side of the

one of the first and second semiconductor dice [die] to which the second portion is secured.

36. (Twice Amended) An interposer substrate for use with at least one semiconductor die having an active surface and a back side, the interposer substrate comprising:
a flexible dielectric substrate having a first portion and an adjacent second portion separated by a spacer portion; [and]
a first plurality of electrical contacts on a first side of the first portion arranged to mate with bond pads of a first selected semiconductor die and connected to a second plurality of electrical contacts on a side of a second portion of the interposer substrate through conductive traces, the second plurality of electrical contacts being in a different arrangement than the first plurality of electrical contacts; and
a third plurality of electrical contacts on a second side of the first portion, arranged to mate with bond pads of a second semiconductor die and electrically connected through conductive traces to electrical contacts of the second plurality.

38. (Amended) The interposer substrate of claim 36 [37], further comprising a fourth plurality of electrical contacts on another side of the second portion electrically connected to the electrical contacts of the first and third pluralities through conductive traces.

50.(Amended) An electronic assembly, comprising:
a semiconductor die assembly comprising:
a first semiconductor die having an active surface, an opposing back side and a side extending transversely therebetween;
a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion, the first portion disposed over the active surface of the first semiconductor die and the second

portion disposed over the back side thereof with the spacer portion over the side thereof, the interposer substrate further including conductive traces electrically connected to the first die and extending between the first portion and the second portion to an array of discrete conductive elements projecting transversely from the back side; and

a higher level packaging structure connected to the semiconductor die assembly through the discrete conductive elements;

wherein said flexible dielectric interposer further including a plurality of electrical contacts on the second side of the first portion in communication with the conductive traces.

52. (Twice Amended) An electronic assembly, comprising:

a semiconductor die assembly comprising:

first and second semiconductor dice having mutually facing active surfaces;

a flexible dielectric interposer substrate having first and second opposing sides and first and second adjacent portions separated by a spacer portion, the first portion being disposed between the first and second semiconductor dice and the second portion being secured over a back side of one of the first and second semiconductor dice with the spacer portion over a side of the semiconductor die over which the second portion is secured, the interposer substrate further including conductive traces electrically connected to the first and second semiconductor dice and extending between the first portion and the second portion to an array of discrete conductive elements projecting from the back side of the one of the first and second semiconductor dice [die] to which the second portion is secured; and

a higher level packaging structure connected to the semiconductor die assembly through the discrete conductive elements.